The MAC Flyer

JANUARY 1980

Men of Vision . . . page 12

The MAC Flyer

MILITARY AIRLIFT COMMAND

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For Greater Safety and Efficiency in MAC Air Operations.

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Flyer Call

Life is full of beginnings and endings, and this month we are at a significant juncture of both. Not only is it the end of an old year and the start of a new one, we also get a crack at a brand new decade. During the '70s we ran the gamut with regard to our flight safety record in MAC. At the peak, we earned the Secretary of the Air Force's Safety Trophy for our achievements in 1977, which included the lowest mishap rate in five years, no passenger fatalities, the fewest aircrew fatalities in the Command's history and a significant reduction in off-duty ground accident fatalities. In the valleys, we lost a lot of valuable people and destroyed quite a few perfectly flyable airplanes through crashes that resulted from carelessness or miscalculation on the part of our aircrew members. What's done can't be undone, unfortunately, but hopefully we can learn from our own mistakes and those of others. Together we can make the decade of the '80s memorable as the safest sustained period of flying excellence in MAC history if we all gear our minds and our energies toward one ideal—Flying Safe. **JGG**

Cover: *Colonel Carl J. Crane (USAF Ret.) "reflies" a biplane mission from days gone by in this artistic rendering of the octogenarian aviation pioneer by Tom O'Laughlin.*

Resolve to Win

You say it's only the second week of the new year and you've already broken all of your New Year's resolutions? Including the one about getting a "Q-1" on your latest checkride? Don't despair, ol' buddy! Your friends at the *Flyer* want to help you keep a resolution and become a winner. Here's how to do it.

First, resolve to enter the 1980 MAC Flying Safety Writing Contest. Then warm up your typewriter, like the delightful distaff in the picture is doing, and put together a good fly-safe story. Your entry can be poetry or prose, fact or fiction and should be about 1,000 to 3,000 words long (six to 14 double-space typed pages). Poetry may be shorter.

Entries should be typed—crayon doesn't reproduce well—and submitted in two copies identified by title only. Attach a cover sheet with your name, address, T-shirt size, and a short biographical sketch.

As soon as your entry is accepted, we'll send you a colorful C.R. Terror T-shirt and put your name on our mailing list for a free one-year subscription to *The MAC Flyer*. Hopefully, these little rewards will start you feeling better about your resolution. If your literary masterpiece is a top-three finisher in the judging, you'll get a

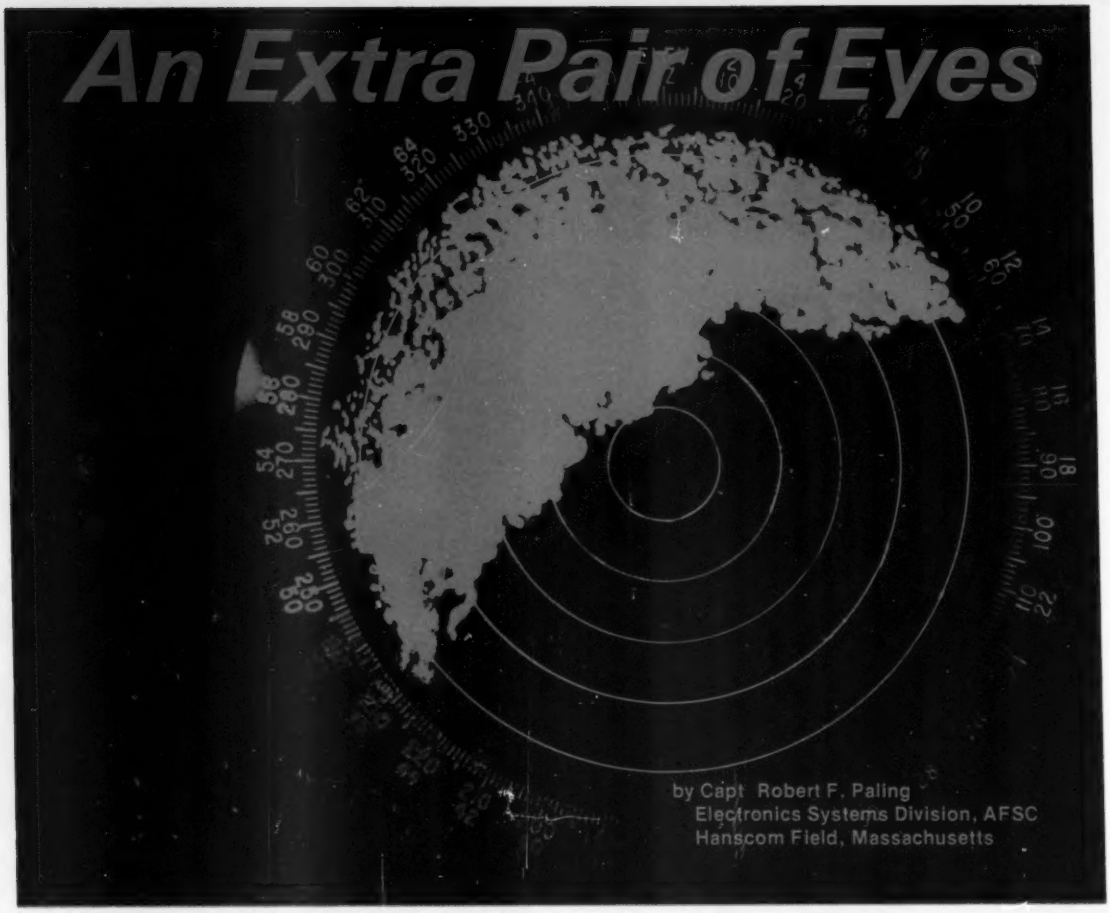
Photographer: TSgt Del Rosekrans, AAVS Model: Susan Wahmeyer

beautiful wood desk set; Honorable Mention winners receive handsome wall plaques. We also send a letter to your commander so he won't forget that you have demonstrated excellent writing ability and a sincere interest in the MAC flying safety program.

The contest closes 31 March 1980, so now is the time to decide to be a winner. Send your entry to:

Writing Contest
HQ MAC / IGFE
Scott AFB, IL 62225

An Extra Pair of Eyes



by Capt Robert F. Paling
Electronics Systems Division, AFSC
Hanscom Field, Massachusetts

If an Aircraft Commander doesn't heed the sound advice of other crewmembers he may as well be flying solo.

Captain Hank Norman wolfed down the last few bites of his inflight dinner and leaned back in his seat to sip his cola and savor the last few minutes of "AN" time before going forward to relieve Captain Cicero at the C-5's nav panel. One of the loadmasters was snoring away in his seat across the table, and two others were engaged in swapping jokes and war stories. The crew had been out for 12 days and they were anxious to get home. But a severe weather front approaching Dover threatened to give them one more RON, even though the Ramstein forecaster had predicted they would beat it by a few hours.

"Hey, Captain," one of the storytellers yelled, interrupting Captain Norman's respite.

"Yeah."

"What's a non-essential bus?"

"I don't know," he answered, although he'd heard the punchline a thousand times.

"A bus full of navigators!" The two laughed and returned to their stories and bull-slinging. Hank smiled tolerantly, and gave up trying to relax. Grabbing his black bag, he headed forward to the cockpit.

"I guess I'm ready to take over now, Chuck. Where are we?" he asked as he approached Captain Cicero at the panel.

"We're nearly to 40 West—be there in 10 minutes. Looks like the inertial has gone bad though. Doppler is pretty close but it goes into memory every once in a while. If you want, I'll

stay in the seat or at least shoot for you."

"No thanks. I could get us home with just a sextant and a mag compass after a trip this long."

Captain Norman settled into the navigator's seat and arranged his gear the way he liked it. He cross-checked his instruments and prepared for the next fix. The IDNE on the C-5 was an excellent piece of equipment when it worked, but there had been many times when his own skill, not the machinery, had guided them across the NAT tracks without a violation.

That was to be the case tonight. Hank's timely fixing, frequent cross-checks and accurate dead reckoning kept the aircraft within one mile of centerline at coast-in.

"I guess we'd better check on the weather," the copilot remarked shortly after passing Gander. Metro informed him the severe weather front was moving much faster than Ramstein had predicted, and would probably arrive at Dover very soon after their ETA. The front contained numerous thunderstorm cells. Several inches of rain had caused flooding in many of the states it had already transited. The storms were intensifying as the system tracked north along the East Coast picking up warm, moist Atlantic air. In addition, several towns had been damaged by small thunderstorm-generated tornadoes.

The copilot updated weather again passing over Maine. Loring Metro confirmed the earlier report: Delaware was in for a night of storms with the front's rapid advance.

At Dover, light rain began to fall around 2000 hours. By 2200, the rain was coming down in torrents, driven by 20 mph winds gusting up to 34 mph. Lightning struck frequently and a tornado touched down briefly on Lockerman Street, causing minor damage to some of the old store facades on the town's main street.

At this moment MAC 90005 was still 100 miles from the base. Captain Norman began picking up weather cells on his radar. "It looks like Dover will be engulfed by storms soon. They're only about 25 miles from the base now," he told his young aircraft commander.

"We can beat the storm in," was the AC's brusque reply. "Descent checklist."

As the aircraft approached Sea Isle, Captain Norman noticed that a huge cell was almost on top of the field. "Pilot, nav, I think we'd better hold or head for an alternate. Dover is going to be directly under a cell before we get there."

"Nonsense," retorted the AC. "I can see the runway lights now."

My Scope is white . . . take any heading you want.

The copilot requested a PAR. "MAC 90005, turn right heading 345 degrees," approach control directed. "This will be vectors to PAR final runway 01." As the crew prepared for landing, the severity of the storm became apparent. They bumped through light-to-moderate turbulence and spotted lightning flashing a few miles away. Rain began seriously obscuring outside vision. By the time MAC 005 was 13 miles out on final, Captain Norman could only see three miles of clear area on his scope. The rest of the CRT was white from the closest thunderstorm cell which had completely covered the base and town.

"Pilot, nav, we need to break off the approach. The storm is over the runway."

"I can see the strobes. We're almost home free," came the reply. Hank began to perspire. The engineer tightened his seatbelt for the third time.

"The lightning is all around us!" called the copilot, his voice cracking.

"Thunderstorm lights," barked the AC. As soon as the copilot flicked the switch, visibility outside was sharply reduced. Crewmembers in the aft flight deck could see a brilliant purple hue through the portholes with lightning seemingly flashing everywhere. A few, including Captain Cicero, thought the end was near as the plane buffeted in the storm. Some even prayed.

"One-hundred above," announced the right-seater. A few seconds later he confirmed Hank's fears, "Go around!"

"Going around," called the AC. "Nav, I can't see anything ahead of us. Let's get out of here! Give me a heading."

"My scope is white, solid white!" came the reply. "Take any heading you want." Captain Norman watched his scope intently. His knuckles were grey from gripping the gain controls. Finally, a small break in the weather appeared. "Turn to 270, now!" he ordered.

Around 2230, Captain Tex Poulan was standing outside the BOQ, drenched to his skin. A few minutes earlier, lightning had struck the building, setting off a fire alarm. Poulan was CE Duty Officer this evening and had already responded to two other lightning strikes to buildings within the last hour. As he watched firemen enter the BOQ to search for possible fires, he felt this was about the worst thunderstorm he'd ever seen. He was also relieved that he was on the ground, rather than flying when he heard the familiar sound of C-5 engines approaching. He couldn't see the aircraft, except for a split second when lightning illuminated the Galaxy as it passed over the airfield. Who would be crazy enough to try to land in this weather, he wondered as he squinted through the downpour.

Pilot, nav. I think we'd better hold or head for an alternate.

For the next several minutes, Captain Norman continued calling out headings while the copilot queried metro for a good alternate airfield. McGuire was as bad as Dover and Andrews was down, too. Langley was just getting out of the storm system however, and could be used. Byrd Field at Richmond was already VFR following the storm's passage.

"Nav, we'll have to use Langley," snapped the AC. "Do we have enough fuel to go around this system and still get there?"

Captain Norman asked the engineer for the fuel remaining. After a few calculations he had an answer. "Pilot, nav. We can't go around this system and still make it to Langley. We planned McGuire as our alternate. Although we made some gas on the crossing, we only have enough fuel to go direct Langley."

"Then give me a heading."

Hank picked his way through storms for the next 30 minutes. Lightning continued flashing closeby, and the crew experienced the discomfort of steady moderate turbulence. Gradually the bouncing subsided, the rain ceased and the clouds thinned

"MAC 90005, descend and maintain 5,000. Contact Norfolk on 125.7," instructed the Washington Center controller.

"Roger, MAC 90005, out of ten for 5,000. Norfolk on 125.7."

Captain Norman copied the clearance, his hands still shaking from the recent ordeal. Checking an ONC chart, he announced, "Five thousand is clear." A few minutes later, the Galaxy passed through 4,900 feet. Hank noticed and called out a warning. "Pilot, nav. I have you 100 feet low and still descending."

"Thanks, nav. I guess we're all getting a little tired. Everyone keep alert on approach."

The C-5 landed without further incident. After engine shutdown, Captain Norman glanced at the engineer's panel—less than 20,000 pounds of fuel remained—practically just fumes for a Galaxy, he speculated silently.

The weary crew performed their 20th bag drag of the trip and were soon on the bus. As they pulled away from the aircraft, color began returning to faces that for the last hour had been pale and ghostly. Thoughts began turning from fear to beer. The AC looked back at his nav.

"You did a good job tonight, Hank."

"Thanks, but I'd just as soon the next leg be a little less hectic. Trying to make that approach at Dover wasn't too swift. You damn near got us killed."

"You're right. I guess the old get-home-itus bug bit me," apologized the left - seater.

I wonder what they'll do when the navigator is gone and they don't have your extra pair of eyes on board? Captain Norman pondered to himself as the AC turned away to discuss the O'Club's menu possibilities with the copilot.

ABOUT THE AUTHOR

Capt Paling is a 1973 graduate of the Air Force Academy. After completing navigator training in September of 1974, he was assigned to the 9th MAS at Dover AFB, Delaware, flying C-5s. He accrued over 1,700 flying hours while with the 436 MAW and upgraded to instructor. Last June, after completing AFIT, Capt Paling assumed duties as a Systems Acquisition Manager with the Electronics Systems Division (AFSC) at L. G. Hanscom Field in Massachusetts.

Capt Harsha and Lt Col Paquin

Ask any flyer to list some really challenging in-flight emergencies and near the top will be engine failures, and electrical system problems while in IMC. Here's the story of a Sabreliner crew that successfully handled *both* problems at once. On 21 August 1979, Capt Robert W. Harsha (FEAC), and Lt Col William C. Paquin (copilot), both of the 1401 MAS, were flying a CT-39 on the return leg of a cross-country training mission from Ellsworth AFB, South Dakota, to Scott AFB, Illinois. About 15 minutes after takeoff, they entered clouds at FL 250. As the altimeters turned through 28,000 feet, all the electrical systems aboard the Sabreliner quit. This caused an immediate loss of pressurization, communication, navigation equipment, attitude indicators, trim, most engine instruments, and the flap system. Noticing that the overcast thinned out above them, they maintained the climb to reach the top of the clouds at 28,500 feet. As if things weren't sticky enough, the left engine flamed out just before they broke out VFR on top. Without electrical power, the engine could not be restarted.

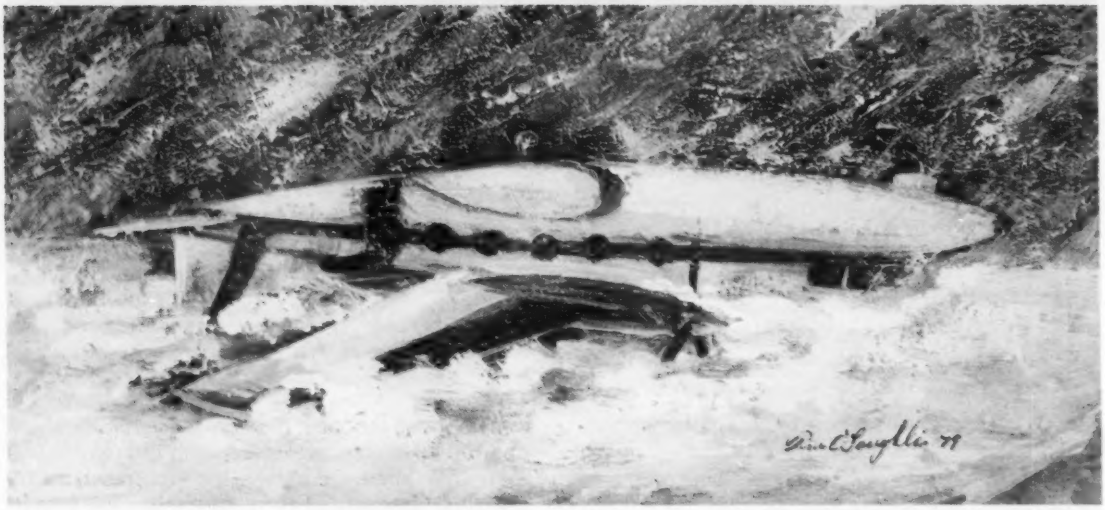
Fortunately, they spotted a hole in the undercast and began a descent in VMC for an emergency landing. The pilots could talk to each other by lifting their oxygen masks away from their faces, but all contact with air traffic control was lost, so nobody outside the airplane knew about their problems. Descending through 10,000 feet, they shed the masks and continued to try checklist procedures to restore electrical power, but to no avail. The pilots determined their position using maps stowed aboard the Sabreliner, and followed a highway back to Ellsworth AFB.

In a final attempt to restore electrical power, all switches were turned off, and on final approach battery power suddenly came on the line. The crew restarted the left engine, began correcting an extreme fuel imbalance, and declared an emergency with Ellsworth Tower. Minutes later, Captain Harsha landed the Sabreliner without any further problems.

Subsequent investigation showed that a shorted battery relay switch caused the electrical failure, which eliminated any possible electrical power. When the switch cooled, power was temporarily restored—just in time for landing. Captain Harsha's and Lt Col Paquin's skillful flying and navigation during a serious inflight emergency saved three lives (theirs and that of an additional crewmember) and a valuable aircraft. They are the first recipients of the MAC Safety Award for Excellence in Airmanship. Good Show.

Mishap with a Moral

SNOW BLIND



Snow had been falling all morning at Benedum airport near Clarksburg, West Virginia. Visibility was less than one mile and the temperature just below freezing.

In the cozy terminal restaurant an off-duty pilot sipped coffee and gazed out the window at a nearby commercial twin prop-jet just starting engines. He could see snow blowing off the wings of the Nord 262 directly behind its rotating propellers, and noticed areas on the outer portions of the wings and tail surfaces where snow remained. He had watched the service people finish deicing the airplane 20 minutes before, but a considerable amount of snow had fallen since—and it was wet, the kind that sticks readily to the cold metal surfaces of airplanes. More snow swirled from behind the engines as the Nord taxied out for takeoff. Sitting at the window, the pilot watched as the airplane began its takeoff roll, accelerated down the runway and finally became airborne in what appeared to him to be a normal takeoff. Just before he lost sight of it, however, the 262 seemed to pitch up sharply and then disappear into the snowy clouds. Moments later crash rescue and fire trucks roared by and people gathered to watch as the emergency vehicles headed toward the far end of the runway.

Another pilot who was out on one of the taxiways got a better view of the takeoff. He estimated the Nord lifted off about 300 feet past his location. Shortly after it was airborne he saw the right wing dip about 45 degrees, then abruptly roll back to the left about the same amount. The right wing dipped a second time just before the prop-jet disappeared from view some 100 feet above the runway. Seconds later, he heard two separate sounds of impact.

The aircraft's right wingtip hit the runway, breaking it off outboard of the engine. The fuselage then flipped over and crashed inverted, crushing the right side of the cockpit. It slid down the runway coming to rest on its back, 60 feet to the right of the departure end of the

5,000-foot strip. Although there was no fire, the first officer, occupying the right seat, died on impact and one of the passengers was killed, apparently because she did not have her seatbelt fastened. Seven of the other 22 passengers and the captain were seriously injured and the aircraft was destroyed.

NTSB officials could find no evidence of structural, mechanical or engine failure that might have contributed to the accident. Photographs taken minutes after the crash, however, clearly showed ice and snow on top of both the wing and horizontal tail surfaces. Since the airplane crashed inverted, this snow could not have accumulated after the mishap. Cockpit voice recorder tapes were recovered in good conditon, but no stall warning sound could be detected. The Board believed the stall warning horn never sounded, indicating that a stall occurred at a low angle of attack below the threshold for stall warning. "Snow or frost on an airfoil," they reported, "will produce such a change in the aerodynamic characteristics of the airfoil" that it will stall at a much lower angle of attack than normal. In fact, because of the snow on the outboard portion of the wings, the normal stall characteristics of the wings were reversed. Usually, a stall progresses from the wing root outward, allowing aileron control for a longer period and giving more timely stall warning from the buffet on the empennage. In this case, the snow on the outboard surfaces, closer to the ailerons, caused them to become partially ineffective before the wing lost enough lift to prevent the aircraft from climbing. This accounts for the successive rolls to the right and left as the pilot attempted to compensate for the loss of aileron control authority. Once the plane was 70 feet above the runway, the added lift and reduced drag created by ground effect were gone, requiring an increased angle of attack to maintain a lift coefficient sufficient to continue the climb. Because the increased bank angles further decreased the amount of lift produced, the Board determined that loss of lateral control "was the primary impediment to the pilot's capability to maintain flight."

The airline company's flight operations manual states that "no takeoff should be made when frost, snow or ice is adhering to wings, flight controls or propellers." FAA regulations contain similar prohibitions.

The station agent asked the Captain if he wanted the plane deiced again, since it was still snowing . . . .

Just before engine start the station agent asked the captain if he wanted the plane deiced again, since it was still snowing, but the captain declined. He may have thought the accumulation was insignificant after the plane was initially deiced, or that all the snow would blow off the wings while taxiing. Since the top of the wings couldn't be seen from the ground and the leading edge deicer boots appeared clean, he may have assumed the entire wing was free of snow. "In any event," the Board concluded, "the captain did not take the proper precautions to insure compliance with company directives and Federal Aviation Regulations. . .consequently, his decision to take off without insuring all snow had been removed from the aircraft's control and lifting surfaces was the cause of the accident."

"Since the captain . . . could not recall any of the events associated with the mishap, the Board was not able to determine why he decided to take off with snow on the wings."

There is little doubt he was familiar with the rules and regulations. But because standard corrective action for snow had been taken by deicing the airplane, he may have felt no need to actually check and see if, in fact, the action taken had achieved the desired result.

Citing violations of existing rules and regulations after an accident has happened, though, is akin to yelling fire after the barn has burned to the ground. It's too late for the people who were killed and it won't reduce the suffering of those severely injured or compensate for the loss of a multi-million dollar airplane. It might, however, help prevent others from making the same kind of decision, especially if they realize that—contrary to the popular old adage for disregarding them—some rules are *not* meant to be broken.

GLOBAL NOTES

AFA Citations of Honor

Twenty-First Air Force and two members of the Aerospace Rescue and Recovery Service are winners of the Air Force Association's Citation of Honor.

The award, presented annually to people or units which distinguished themselves in aerospace activity, goes to 1st Lt Thomas E. Kraft and Msgt Wayne L. Fisk, Det 1, 33 ARRS, Clark AB, Philippines. Lieutenant Kraft earned the citation for his part in a rescue mission in the South China Sea. The H-3 pilot and his crew located survivors of the capsized Philippine cruiser by using vectors from a radar controller, and then spent 15 grueling hours—much of it in complete darkness with only aircraft lights and flares to see by—hoisting 14 survivors of the stricken vessel to safety.

Sergeant Fisk earned the AFA's recognition for several accomplishments, including his contributions in developing ideas for helicopter use during wartime rescue situations. Additionally, he was deeply involved in Cope Thunder's simulated air warfare rescue missions. Sergeant Fisk also provided financial assistance to 11 Filipino families and a Filipino medical student.

The East Coast Numbered Air Force received the AFA award for its role in providing airlift support during various exercises, contingencies and humanitarian missions last year. Included were the airlift of snow removal equipment to snowbound sections of the U.S., transportation of UN peace-keeping forces to the Middle East and other areas of the world, and humanitarian airlift support following the Jonestown, Guyana, mass suicide.

Herculean Humorist

"I always doodled," Dave Davenport says. "With my interest in planes, I decided to draw aircraft cartoons as a hobby."

During his first assignment at Dow AFB, Maine, the now retired jet engine technician and aircraft mechanic started doing cartoons for the base newspaper. Later, at Pope AFB, North Carolina, he zeroed in on characterizing C-130s for *The Hercules Herald.* "I spent so many years working, flying, fighting and cussing with the C-130, I learned the Herk does have a personality," comments Davenport.

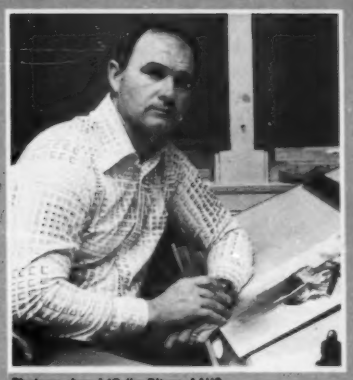
Speaking about that personality, which he cultivated respect and admiration for during a 12-year association, Dave feels "there are quite a few people who agree with me." Especially those "who remember how the C-130 pulled their bacon out of the fire."

Busy with post-retirement art classes and a budding T-shirt business, Davenport credits his wife, Margaret, with the original ideas for many of his cartoons. "I have her final approval before I call a cartoon finished," he says.

A sample of Dave Davenport's Herky humor appears below.

New *TMF* Staff Members

Photographer: A1C Jim Bitner, AAVS



Photographer: A1C Jim Bitner, AAVS

Although they have been hard at work for a couple of months already, *TMF* would like to officially welcome two new staffers.

Taking on the challenging and sometimes overwhelming job of Safety Awards person and Managing Editor of *The MAC Flyer* is Ms. Lorena M. Graul. A genuine Certified Professional Secretary—that's what "CPS" stands for after her name on the staff list—Lorry, as she prefers to be called, is now available to answer questions on the various Safety Awards for MAC and Air Force. Soon she will be in the thick of processing the annual Safety Awards for MAC, AF and the National Safety Council. Lorry also does a number of things for *TMF*, including keeping track of the magazine's distribution and mailing each month.

Our new Art Director is Tom O'Laughlin. He replaces Brian Gauss, who moved on to more lucrative pastures with a higher GS rating. A former Navy "gob," Tom has a strong background in commercial art that includes everything from sign painting to several years as an Air Force civilian graphics specialist. Able to wield a mean brush and draw a fine line, Tom will be "fully checked out" as soon as we can convince him to show all the people he illustrates in *TMF* wearing Nomex flying apparel.

Eagle Eyes Avert Trouble

Capt James B. Davis and his Det 9, 67 ARRS, helo crew preflighted their UH-1N and found everything to be shipshape and ready to go before they launched to participate in a CRISEX 79 scenario. Following a live hoist pickup from an altitude of 35 feet, TSgt Ronald M. Clark, the flight mechanic, spotted some damage to the hoist cable. Although two more hoist pick-ups were planned, Capt Davis elected to land the Huey, and a more extensive examination revealed fraying on the outer cable and complete separation on the inner cable at the swage. Had Sergeant Clark failed to notice the defective strand, or had Capt Davis elected to press on before checking things out, a serious incident would almost certainly have occurred during one of the subsequent live pickups. A tip of the *TMF* flightcap goes to this 30 ARRW crew for being alert and exercising sound judgment.

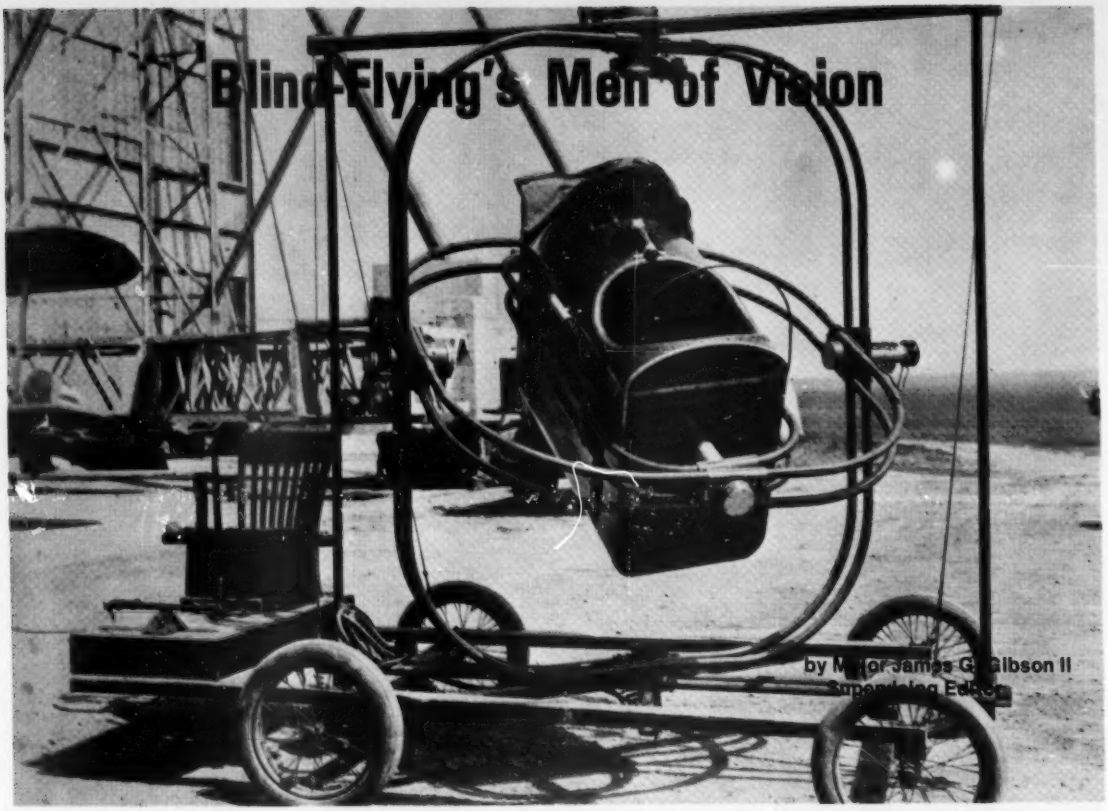
New Aircrew Rep Named

CINCMAC has a new Special Assistant for Aircrew matters. He replaces Capt Jerry Lundquist, and his name is Capt Ron Porter. Aircrew enhancement continues to receive a high priority in MAC and Capt Porter is expected to keep the CINC provided with up to the minute feedback on problem areas identified by aircrew members.

Comments, complaints or suggestions relevant to aircrew utilization, treatment or management should be referred to Capt Porter by letter at HQ MAC/CCT, Scott AFB, IL 62225, or by telephone at Autovon 638-2041. When you are relating a problem or a comment, specifics such as times, dates, names, places and events are a great help in generating solutions and answers expeditiously.

Ron Porter is a MAC pilot who has been a flight examiner in C-141 and C-5 aircraft, and his operational experience includes duty in both the Pacific and Atlantic areas. He understands and speaks "aircrew" fluently.

Blind-Flying's Men of Vision



by Major James G. Gibson II
Superintending Editor

First Instrument Flight Simulator—A WWI Ruggles Orientator equipped with a gyro turn indicator and mag compass and used by Ocker and Crane for training at Brooks Field, Texas. Circa 1929 .

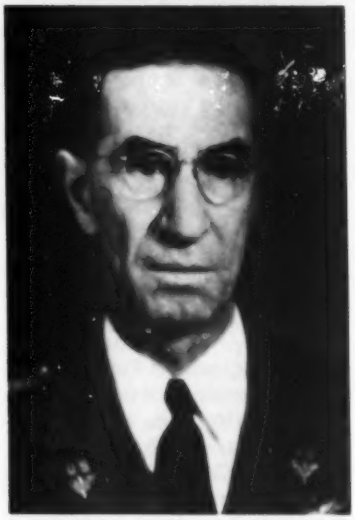
Chances are, unless you happen to be a 14-karat flying history fanatic, you've never heard of Colonel William C. Ocker. During the post-World War I era, he carved out a niche in aerospace lore by uncovering the reasons for vertigo and developing principles for "blind" or instrument flying. Ocker fought a bitter, frustrating and often painful crusade to convince his contemporaries and superiors that his concept of relying on instruments, rather than the seat of one's pants, when flying in weather was vital to flight safety. After fighting the battle alone for several years, he was joined in 1929 by another flying officer who became his "man Friday," protege and coauthor, in 1932, of the first blind flying textbook. Ocker's disciple was an illustrious but equally unsung air pioneer, Colonel Carl J. Crane, and this is the story of their contributions to what has become the art and science of safe, all-weather flight.

On a clear December day in 1925, Lieutenant Crane, a relatively recent graduate of Army-Air Corps flying training school (two classes after Charles Lindbergh) was tasked with carrying a congressman's son from Selfridge Field to Washington, D.C., in the back seat of a deHavilland biplane. Near Detroit, at an altitude of about 3,500 feet, what appeared to be a bank of ground fog threatened to block their way. Thinking he could climb a little and stay on top, Crane pressed on—but the cloud deck kept rising. "Finally, at 8,000 feet," as he recalls it, "I busted right into the stuff." Crane continues, "We had no instruction in weather flying in those days, and the airplane only had a magnetic compass; but nobody believed it anyway because it was never swung properly. We did all our own flying by eyeball.

"Now I was beset with a problem, so I throttled the Liberty engine back to get down below the clouds. Soon we were in the inevitable spiral dive, with the wires screaming and the airplane going about 150 mph—pretty close to its terminal velocity. It takes a while to get down from 8,000 feet in a DH-4, so I fought it and worked with it and did everything I could think of doing—but nothing helped."

At about 4,500 feet, Crane looked back to see how his passenger was faring and observed to his surprise that, "the young man was just elated. It was his first airplane ride and he was smiling and waving." Knowing what a serious dilemma they were in, however, the lieutenant was "sweating and wondering what to do next" as the biplane spiraled through 3,000 feet (Crane calls 3,000 the "praying altitude") and continued to plummet earthward. "It got darker and wetter," remembers Crane, and as they passed below 1,000 feet he felt the end was near. "I turned to check on my passenger one last time, and as I did," he explains, "a big sign went by my wing that read 'Statler Hotel'—I had just missed the top of the Statler Hotel in Detroit." Below the clouds where he could see the ground again, the much relieved aviator was finally able to level the DH-4 and continue his journey. He was shaken by what had happened, but perhaps equally important, he was extremely curious as to *why* it had happened. That insatiable curiosity over his brush with death in the clouds had a profound and lasting influence on Crane and resulted in his making an impressive number of innovations and contributions to instrument flying knowledge and technology during the past five decades.

Curiously enough, William Ocker, who was 20 years his senior and was to become sort of a mentor to Crane, entered the clouds in a DH-4 on a wintery day in 1918, and *also* came out in a spiral dive from which he barely recovered in time. In his case an added irony was provided by the fact that he had a Sperry gyroscopic turn indicator mounted on his biplane. The newly designed instrument was a personal gift from Elmer Sperry himself, but once in the

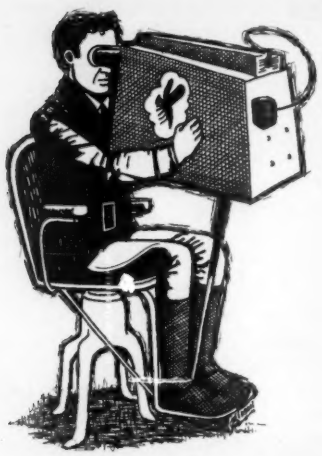


Col William C. Ocker "Father of Instrument Flying"

soup Ocker lost faith in the gauge and elected to trust the seat of his pants rather than the "crutch for the compass," as Sperry labeled his buzzing gyro device. The resulting spiral dive started Ocker thinking, but it wasn't until 1926 that he finally figured out the relationships between visual reference limitations and disorientation. The pieces of the puzzle fell into place while he was receiving a vertigo demonstration from Flight Surgeon (Lt Col) David A. Myers during his routine mid-year physical. Shortly afterward, Ocker began his crusade to get blind flying instruction included in Air Corps pilot training programs. The reason he met so much resistance, according to Colonel Crane, was, "veteran military flyers felt strongly that flying with instruments downgraded their expertise as a pilot. Born pilots didn't need gauges!"

Both Crane and Ocker knew well from personal experience, and the disastrous rate at which airplanes were spiraling out of the clouds in the 1920's, that something was needed to assist even the "expert" pilots foolhardy or unfortunate enough to get into the clouds for very long. The stage was thus set for the two flyers to become allies in battling the ignorance about—and prejudice against—the use of flight instruments, when their paths finally crossed in 1929. Good fortune was surely smiling on the aviation fraternity the day Ocker was issued orders to report to Brooks Field, Texas, near San Antonio, as an instructor pilot. Lieutenant Crane was stationed there, and had already been conducting informal experiments with blind flying training on his own initiative. Soon after Ocker's arrival, he met Crane and their friendship was sealed following a demonstration of the older flyer's discoveries about vertigo. Placing Crane in a flight surgeon's Barany chair, Ocker gave him the special box he had built three years earlier, and showed him how to orient himself to turns in the spinning seat by viewing and depending on the gyro controlled turn-and-bank indicator the box contained. When he disregarded the erroneous signals provided by the seat of his pants (his inner ear, actually) and followed the gyro, Crane was able to correctly identify whether he was in a

right or left turn in the chair during the crude but convincing instrument flight simulation. At last the lieutenant had an answer to the question that had been bothering him ever since that fateful day over Detroit, and he joined forces with Ocker in the crusade to promote instrument flying training in the Air Corps.



Ocker's award-winning "needle, ball and black box" demonstration.

In spite of the dramatic and conclusive demonstrations of vertigo and the value of instruments in preventing it, which Ocker had proved time and again with his "black box," the fight to gain favor for blind flying training in the military continued to be an uphill battle. Before coming to Brooks, Ocker's very sanity had been twice subjected to medical scrutiny at the request of his superiors because of his strong and vocal stand on vertigo and how it could be circumvented. He was given a clean bill of health in both cases, and liked to say in jest that he was the only Air Corps officer who had two official documents attesting to his sanity. But resistance to his notions remained intense among many of his superiors. For example, the same year he developed a simple but effective simulator for testing and training pilots in the use of instruments (1928), the following edict was issued by the Director of the Air Corps Primary Flying School:

> It is strongly recommended that instrument training and training for blind flying be not included in any phase of training at the Air Corps Training Center.

Brushing aside reluctance on the part of most military pilots and officials to heed Ocker's warnings and yield to his proven conclusions, he and Crane continued conducting blind flight tests and studies together, and frequently they were invited to speak about their activities at aeronautical gatherings from one end of the country to the other. Late in the fall of 1930, they traveled to Brooklyn, New York, where Elmer Sperry made them a gift of Serial No. 10 Artificial Horizon and Directional Gyro. "With that indicator," says Crane, "we equipped the first airplane at the Training Center to have full panel instrumentation and a radio receiver." After refurbishing the unused experimental radio range transmitter at Kelly Field and putting it back on the air, they began the first program of "full panel, blind flying, radio range instruction in the Air Corps."

Their persistent campaign paid off that year when the Air Corps finally approved adding training "under the hood" to the flying school's curriculum. Speaking at graduation ceremonies for the October 1930 class, which was the first to receive what officials considered to be "a full course covering every phase of flying by instruments," General Danforth, the ATC commander, offered these words of praise and encouragement, "One outstanding thing, to my mind . . . is the work of two officers, Major Ocker and Lieutenant Crane, who have devoted months of intense work to make flying safer. . . ."

Meanwhile, the standard policy for military flyers, as Crane remembers it, was still, "keep out of bad weather," and "land rather than penetrate obscure weather." As a result, he reminisces, "Many 'Forced Landing Reports' were submitted after unpremeditated stints on the ground for bad weather."

Together, Ocker and Crane developed the needle-ball-airspeed procedures to retain control in IMC, and they coauthored the first book spelling out instrument procedures, *Blind Flying in Theory and Practice*, which was published in 1932. Ironically, the Russians were among the first to adopt it, and they used their translated version as a standard text for Soviet flyers for many years. Sales of the book were also brisk among

The standard policy for military flyers was still, "keep out of bad weather."

America's civilian pilots who couldn't afford to lose revenue by standing down every time the weather was less than ideal, according to Crane. But 13 years passed before its teachings were finally approved for Air Corps instrument schools. Although their ideas and innovations were appreciated in limited flying circles and by some of the more perceptive military commanders such as General Danforth, about the only noteworthy official recognition either received was the $1,000 prize the U.S. Patents and Design Board awarded to Ocker for his "needle, ball and black box" demonstration. This device, which was the same one he had used to show Crane and many others vertigo and how it could be compensated for, was chosen over 4,840 other submissions. The true significance of it was recently highlighted by noted aviation writer Jerome Lederer, who pointed out that "discovery of a means to fly without reference to outside visual references has been the most important contribution to the reliability and safety and thereby the growth of aviation."

Although there tended to be somewhat less skepticism against instrument flying from civilian aviators, there were those who fought the idea just about as vigorously as the military opponents. Crane recalls a humorous but pointed incident in 1930 involving a Frenchman, Joe Lievre, who operated a small civilian airport near Brooks Field. One day, this "diehard," as Crane calls him with a grin, tossed out a challenge. "You military pilots, you don't know how to fly. I fly like a bird; I don't use instruments.

Unable to resist a chance to deflate the civilian's cocky boast, Crane and Ocker obtained two carrier pigeons from the Army folks at Fort Sam Houston. "We hooded 'em with Bull Durham tobacco sacks and I told Joe to take 'em up in his airplane and drop 'em out while we watched from Brooks," Crane recalls. "Out came pigeon number one and he couldn't hack it. He rolled over on his back, and stalled, and got in a spiral dive. Finally, he held his wings at a high diehedral angle

"We hooded 'em with Bull Durham tobacco sacks" . . . and Joe dropped them out of his airplane.

and floated the rest of the way down like a parachute—didn't even sprain an ankle on landing. As soon as we took off his hood, he regained his bearings and flew back to Fort Sam." Bird number two had the same problems. The obvious failure of the pigeons to fly blind had the desired result, and according to Crane, "Joe Lievre was a believer after that."

Another demonstration the two instrument pioneers used to enjoy was showing skeptics of blind flying theory what Ocker called "the natural spiral tendency in all animals." Placing a "victim" at the edge of an airfield or any other suitably wide, clear area, they would blindfold him and then instruct him to walk straight across to a point on the other side without peeking. "Invariably, the person would begin deviating off course in a broad arc to the right or left, and that arc would tend to tighten into a spiral pattern after about 75 yards," explains the colonel. Time after time, Ocker and Crane used this demonstration to prove that, denied visual cues, a person will find it virtually impossible to continue traveling in a straight line for very long, even on the ground.

Although the handwriting had been on the wall for many years, thanks to Ocker's and Crane's crusade, a pressing need for blind flying expertise was not felt by the military until 1934, when a presidential cancellation of airline contracts dumped the responsibility for carrying the airmail squarely into the laps of the Air Corps. A series of disasters early that year finally succeeded in pointing up the necessity for accelerated instrument training, improved instrumentation to instruct and fly with, and better communication and navigation gear.

Resistance by some was far from eliminated, however, right up until World War II. Feelings among detractors were strong, for example, that it was a waste of time to train bomber pilots to fly instruments because their missions were supposed to be carried out under visual conditions. With few exceptions, such as advanced pilot candidates and instructors, significant numbers of military flyers were not trained to fly in obscured weather until 1943, a year after Colonel Ocker died at Walter Reed Army Hospital. Similarly, even though the airlines began teaching their pilots the rudiments of instrument flying as early as 1929, really stringent requirements for a rating in that ability were not made part of the criteria for a U.S. Commercial Pilot License until 1974.

Next month: The Conclusion of Blind-Flying's Men of Vision

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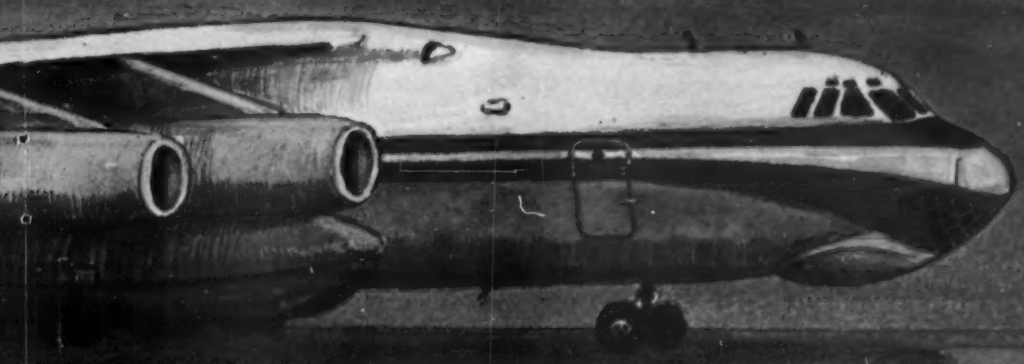
...signed to airlift about 40 ...e of 2,700 nautical miles at ...go compartment is fully ...g takes place through the ...pped with clamshell doors ...y. The main landing gear bogies, each made up of ...n two rows. During retrac- ...e rotate 90 degrees so the the fuselage before being pulled vertically up into the fairing. It is capable of operating from unprepared runways. The four Soloviev D-30KP turbofan engines are rated at 26,500 pounds of thrust each, which gives it a normal cruising speed of about 450 knots and an altitude ceiling of over 40,000 feet. Although the original models had dry wings, the newer long-range IL-76T has a 20 percent greater fuel capacity that increases its range to 3,600 nautical miles. The T-model is used primarily on international routes while the shorter range versions fly mainly within the continental boundaries. Like some other Soviet transports, the military version is equipped with a tail gun.

The Candid has all-weather capability with up-to-date avionics and a computerized autopilot with an auto-land system.

A wing span of 166 feet and a length of 153 feet make the Candid's outside dimensions only slightly larger than the C-141A. Maximum take-off weight is 346,000 pounds (375,000 pounds for the T-model) with a maximum payload of about 88,000 pounds.

The IL-76 has catapulted the Soviets into the jet age of airlift and significantly increases their capability to project power on a global scale.



Nobody wants to be involved in a mishap, but if you are it might help to know both your obligations and rights during the subsequent investigations.

Who Can I Talk To?

by Capt James P. Coe
Associate Editor

In last month's issue, we left a hapless crewmember standing outside a crash-landed airlifter trying to cope with a hard-charging news hound until the Public Affairs Officer arrived. Our flyer was soon retrieved by the medics from a crash response team and whisked away to the hospital for examination. The flight surgeon pronounced him in fair condition and recommended 24-hours in the hospital "for observation." Join us now as our crewmember starts enduring what will seem like an eternity of questions and answers.

The aircraft emergency that brought our flyer, we'll call him Max, and his transport aircraft to a less-than-ideal mission termination wasn't completely covered in the book—or at least not in the 30-second review of the Dash One that he did before the alligators got armpit deep. Max and his crew of experts followed the checklist procedures that seemed most applicable, and even tried a few tricks of their own, but still ended up making a landing that crumpled a lot of sheet metal. Some nagging questions are running through Max's mind: How are the other crewmembers? How about the pax? Did we do everything we could have done? Am I up for a DFC or a court-martial?

These are valid concerns and some don't have pat answers.

The doctors can probably assuage apprehensions about other crewmembers and passengers, but it will be a long time before all the "Who shot Willies?" of the accident are sorted out. Investigators will be playing a lot of "20 Questions," and answers by all crewmembers involved in the mishap must be tempered with personal integrity and a knowledge of the investigation systems involved, if they are going to do the best thing for the Air Force and themselves.

Max and crew crash landed at a non-MAC base. Since their accident happened "out in the system," initial information about the accident got to Max's squadron and wing commander through the base command post communications network. This is the first accident reporting system: we'll call it the command-management system. The mishap is reported to intermediate headquarters and Headquarters MAC. In a short time, appropriate functional managers at Scott will also get phone calls telling them about Max's calamity. Because of their preliminary nature, these first reports will usually include only the most basic information. For example, "At 1927Z, a C-141, tail number 87654, crash landed at Muckinville AFB. Major damage to the aircraft. Minor injuries to five crewmembers and ten passengers." Before long the teletype messages begin to flow, backing up the initial phone calls with "hard copy." Also, the local commander will send an OPREP-3 message that lets other Air Force agencies know what's happening.

After the doctors say it's okay, one of Max's first visitors is Captain Chuck Mason, the pilot member of the base interim safety mishap investigation board. Chuck assures Max of the privileged status of his statements and reminds him that the "Safety Board isn't trying to establish fault and blame for punitive purposes, but is just attempting to keep another like-mishap from occurring. The two captains talk for about 20 minutes, with Mason taping the conversation, and promising Max a typed transcript for his review the next day. This is Max's first encounter with one of the two investigating groups that will produce formal reports about the aircraft crash. He learned the information in the following paragraphs from experience—hopefully you won't have to.

Safety Investigation Board

The safety investigation board has gone by several names over the last few years, the most common—an perhaps confusing—being "accident board," but their current official handle is the one in bold type above. Their existence is mandated by the 127-series regulations and manuals. For short we'll call them the "Safety Board."

. . . you can submit a statement of rebuttal for consideration by the people who review it after the Safety Board is finished.

According to regulations and practice the purpose of mishap investigation is mishap prevention. This concept is based on finding the most likely causes for an accident, then taking positive action to prevent the same cause factors from bringing about another. To get the job done, the Safety Board will look at the machine, the entire environment of the mishap, and the people involved. They will determine all of the relevant human and material factors and then publish their report containing both the facts and their analysis.

Depending on the severity of the situation, Safety Boards are appointed by CINCMAC, or the commander of a numbered Air Force or ARRS. The board is directed by a president who must be a colonel or above. Other members of the Safety Board include: investigator, pilot member, maintenance member, a flight surgeon and a nonvoting board recorder. Agencies such as AFCC, aircrew life support, and Air Weather Service may have members on the board if their function is directly involved or implicated. Additionally, AFR 127-4 provides for a "commander's representative" as a voting member. These board members represent any commander whose equipment, facilities, or people are involved. In the case of Max's mishap, the local base commander placed an officer on the board because the MAC aircraft crashed on his base and was attended to by the base crash response team.

As crewmembers, you are probably most interested in the status of witnesses appearing before the board and the meaning of "privileged status." Witnesses making statements to the Safety Board are advised that their testimony is confidential and will be used only for accident prevention within the Air Force. They will not be sworn in nor advised of their rights, because nothing they say can be used against them. As a crewmember involved in a mishap, the board is going to be interested in what you remember about the accident, and in your opinions. As far as they're concerned, you are a good indicator

of what really occurred since it happened to you. Also, your testimony may point to ways of preventing a similar mishap in the future.

After the Safety Board has analyzed the physical evidence and witness statements, they prepare a two-part mishap report. Part One contains the facts collected by the board. It can be released by the Air Force Inspection and Safety Center (AFISC) to the public on request. Part Two features the board's analysis, findings and recommendations. It also holds personal data about the folks involved, flight surgeon's reports, and witness testimony. Part Two is considered privileged and is not releasable to the public. The report's status is based on the concept of Executive Privilege derived from the separation of powers spelled out in the U.S. Constitution. The privileged status of Safety Reports has been upheld in court.

If you are cited as a cause factor in a safety report you can submit a statement of rebuttal for consideration by the people who review the package after the Safety Board is finished. This is an important right and shouldn't be overlooked.

Safety reports are reviewed by commanders and their staffs from the aircrew's squadron on up. Each level of command may concur, partly concur or nonconcur with any or all of the Safety Board's findings, causes, and recommendations. AFISC makes the final determination of causes. Remember, the Safety Report itself cannot be used for any type of legal, disciplinary or administrative action. Its purpose is preventing mishaps.

Aircraft Accident Investigations

The aircraft accident investigation under AFR 110-14 has often been called the "collateral board," but Accident Investigation is really a more descriptive term. The work may be done by a single officer or by a board of officers, depending on the complexity of the accident and the desires of the appointing commander. The investigation is initiated by the commander of 21st or 22d Air Force, or ARRS when claims against the government are likely, a fatality is involved, the mishap draws a lot of public interest, or for several other reasons defined by AFR 110-14. The purpose of the Accident Investigation is preserving factual evidence. Its report can be used for litigation, claims, disciplinary action, administrative proceedings and many other purposes.

The Accident Investigation (collateral) Board report can be used for litigation, claims, disciplinary action, etc.

When investigating a major aircraft accident, the Accident Investigator is normally a senior rated officer who is assisted by a legal advisor from the Judge Advocate. The Investigator may call on appropriately qualified experts in operations, maintenance, flight medicine, and other specialities to help him; they may or may not be appointed as an Investigating Board. The Accident Investigation's relationship with the Safety Board is restricted by AFR 110-14 and AFR 127-4 to insure the privileged status of the Safety Report. The Accident Investigation gets any physical evidence and photos as soon as the safety investigators are through with them. Witnesses who appear before the Safety Board cannot be questioned by the Accident Investigation until they are released by the Safety Board President. Additionally, witnesses cannot be asked anything about the Safety Board's analysis, findings or recommendations, neither can they be questioned about what they told the safety investigators. Safety officers are not appointed to the Accident Board because of their access to privileged information.

If you have a lawyer, this is the place to consult with him or her. As a member of the USAF you must appear before the Accident Board when called. You'll be sworn in and you'll be advised of your rights under Article 31 of the UCMJ if suspected of the wrong doing. Anything you say, can and probably will, be used in legal actions against the government, aircraft manufacturers, and possibly you. If you aren't familiar with your rights, check out the box to the right.

The Accident Investigation report under AFR 110-14 only contains the facts; this board does

not draw conclusions or make recommendations. However, the report is reviewed by commanders up and down the chain of command and interested staff agencies. These agencies and commanders make further recommendations for unpleasantries like courts-martial, flying evaluation boards, administrative downgrade, involuntary separation, etc. This is why your rights are very important, even if *you* know you didn't do anything wrong *and* the Safety Board exonerated you of any cause factor.

As a member of the USAF, you must appear before the Accident Investigators when called.

Also, you might be surprised what is in the 110-14 report that could be published in any public media. The reports contain the date, time, place and circumstances of the accident, and the aircraft tail number and call sign. The name of every crewmember and his or her unit of assignment is also there. Any facts on paper about you may also be in the report if the Accident Investigator thinks they are worth preserving—like flight records.

The accident investigation under AFR 110-14 is not required for every Class A or B mishap. However, commanders have several other ways to gather evidence for various administrative and judicial actions. Among them are inquiries under AFR 120-3 and preliminary investigations governed by the Manual for Courts-Martial. In any case, the commander is seeking to discharge his responsibility to the public for the materiel and personnel resources assigned to him. All investigations are his way of insuring fair treatment for both the Air Force and the individual crewmembers. Some yield mishap prevention information, others may result in adverse administrative or judicial actions, and some may even provide material for accolades and medals.

This brings us back to our title question, "Who can I talk to?" There is probably no "text book" answer. You need to know how to handle the press if they catch you at the scene of the mishap before the PAO arrives—or want to interview you later. Also, you have responsibilities for the protection of classified material that your unit security manager will probably be glad to explain. Finally, you need to understand the investigation groups you will be working with after an aircraft mishap, and be acutely aware of your rights and limitations. With this in mind you can speak freely where it will do the Air Force and you the most good, and still protect yourself—with the advice of good counsel—from possible unpleasant encounters with the judicial or administrative systems. Of course, the best way to *avoid* having to decide whom to tell what after an accident is not to have one.

Statement of Privileged Status

(AFR 127-4)

This investigation is conducted solely for mishap prevention purposes within the Air Force and your statement will not be disseminated outside the United States Air Force or used as evidence in disciplinary actions or adverse administrative actions such as a flying evaluation board, or determining pecuniary liability or elimination from the USAF. It is used to determine all factors relating to the mishap and to avert recurrence.

Rights of Military Witnesses

(AFR 110-14)

You have the right to remain silent. Any statement you make may be used against you in courts-martial or administrative proceedings. You have the right to have a lawyer present. You may choose a civilian lawyer at your own expense, or the Air Force will appoint a Judge Advocate to assist you free of charge. You may stop answering questions at any time so that you may get or consult with a lawyer.

Are You an AC or Just a Pilot?

This article is reprinted from Flight Facts, *TWA's magazine for aircrews. It raises several interesting questions that military and civilian aviators should consider. By changing a few terms, like "captain" to "AC", or in some cases "cabin attendant" to "loadmaster" or "med tech," MAC crewmembers can probably project themselves into nearly every situation described in this story.—Ed.*

Not too long ago the FAA authorized what they called the Special Air Safety Advisory Group (SASAG), composed of six highly respected, recently retired airline captains. The group conducted an on-the-spot survey of airline operations across the United States and submitted a report on problems observed, along with recommendations for solutions. They rode jumpseat on some 600 flights on 27 U.S. airlines over a four-month period. Their report and recommendations filled 37 typewritten pages.

The Group's views on an area they label "Command Deterioration" are very interesting. We quote from the SASAG report: "In some airline crews SASAG found deterioration in command that adversely affects safety. Various factors have created this condition.

"As the airline industry and the aviation governing agencies have grown, more procedures and precise methods of operation have been developed. Air Traffic Control is a large part of this; pilots are strongly directed by ATC, with the need for precise performance of ATC's requests. Company procedures have resulted in computer flight planning that gives the pilot little time, opportunity or motivation for making the final

flight plan selection. The movement toward all-weather operation generates a subconscious, but real, feeling in pilots that flights are no longer canceled because of weather. Weather information is often inadequate and presented to the pilot in a form not conducive to a full judgment of conditions.

"Cabin attendants do not relate to the flight crews, often are not part of the safety team and do not understand they are under the command of the Captain.

"With all this has come a new type pilot from the military, who is accustomed to following orders and flight plans prescribed by military necessity. All members of the flight crew are often of a similar age and, in some cases, copilots are older than the Captain.

"These factors have developed pilots-in-command who sometimes are confused as to where their command begins and ends. They tend to do what the system tells them, responding precisely to ATC requests with little question even though a flight path may be through hazardous weather. They follow computer generated flight routes even though better routes are available for weather avoidance or economy. They tend to leave the problem of terrain clearance to the ATC controller. They are not commander of the cabin teams, and conditions have occurred in which the cabin team, on its own, initiated emergency action that was not needed and created dangers."

The Captain is the "pilot-in-command." That definition must be taken literally. Ultimate

Ultimate responsibility can only be accepted if one also has the ultimate authority.

responsibility can only be accepted if one also has the ultimate authority. When one is charged with the full responsibility for several million dollars worth of airplane and cargo plus dozens of passengers, it is an expression of confidence that is unique. It should be very sobering to the individual so honored. His importance to the company is enormous. Snide detractors claim he is overcompensated for just flying an airplane from "A" to "B," but there are times when he alone earns more than he could ever be paid. It is his judgment and skill based on knowledge and experience that warrant his salary.

When pilots are upgraded . . . little is done to include training in the command function, its limitations and responsibilities within the system.

It may not take a special kind of person to accept such a rather awesome responsibility, but there are many who are unable to. It must be borne easily. If it weighs too heavily, one's mental state and health may suffer. A balanced personality is necessary to properly exercise the authority. Hundreds of decisions are made each month and each must be the product of sound, unemotional reasoning. Relationships with subordinates should be cordial, but totally businesslike in the airplane. Popularity is not a primary requirement.

The Captain's responsibility for the professional conduct of the flight requires firmness along with tact. He must insist upon, and practice, teamwork. He must set high standards of performance and demand them of others. He must point out mistakes to others and admit to his own. By so doing he can justify added care in use of checklists and other routine functions. *No Captain can accept mistakes as being normal. Sloppy Captains develop sloppy First Officers,* and they both make poor backup pilots. Any and all errors must be recognized and admitted, and immediate action taken to eliminate them in the future.

Despite what the flight attendant's announcement may proclaim, the flight is not "under the command of Captain A and First

Officer B." Captain A is in sole command and the cabin crew should remember it. A Captain does not permit a First Officer to run the flight, make his decisions or even communicate improperly. Everything is done right and is under firm control.

Some of the more observant old timers in stations around the system say that they can often tell who is Captain of a flight—and who

isn't—by the way it is operated. Some—most, really—are smooth and trouble-free, with unusual events being handled routinely and decisions made in advance. Others are a continuous man-made crisis. What do they say about you? Are you a Captain or just an airplane pilot?

"The cockpit often develops too much of a 'buddy' atmosphere," reports the SASAG, "with excessive kidding, and with the copilot attempting to overrule and dominate the Captain, and doing it successfully.

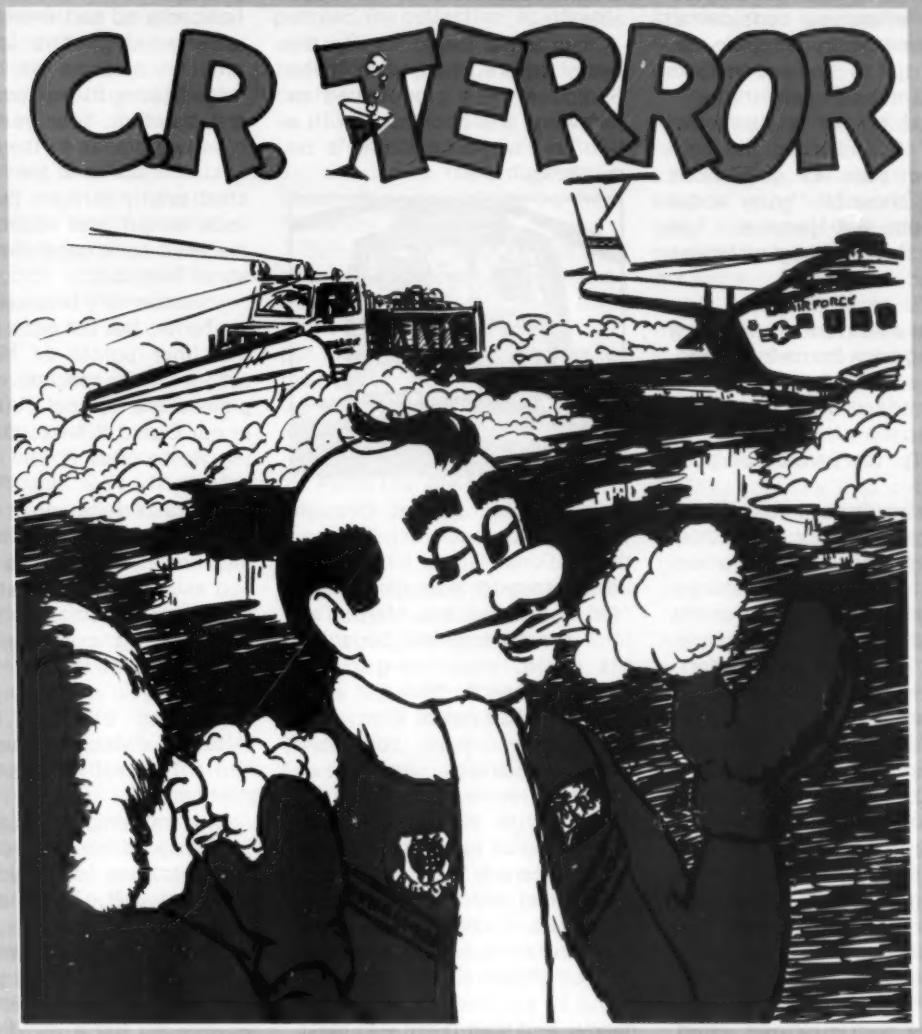
"It is almost automatic that Captains and copilots alternate flight legs and in many cases, because pilots are equal in age and experience, the Captain is reticent and slow to correct any errors of the copilot and seemingly embarrassed to take over a flight leg when the weather is bad." SASAG witnessed extremes such as the copilot making a landing during winds of 50 knots, doing a poor job of flying, and touching down at reference speed plus 40 knots, with the Captain making no move to correct him.

"This is not a criticism of the pilots, but rather of airline management, the FAA and the pilots' unions for allowing the situation to develop," concluded the study group. "When pilots are upgraded to Captain, little is done to include training in the command function, its limitations and responsibilities within the system, either by the airlines or the FAA. They could be realizing their responsibility by promoting the stature of the Captain and his command responsibility.

"Aviation has not reached a stage where it can be automated with inflexible procedures and methods. The science of weather forecasting and reporting has not reached an exact, completely reliable state, and an aircraft commander is faced almost daily with unexpected weather changes and conditions that require judgments only he is in a position to make. Aircraft, though highly reliable, still have malfunctions with emergencies that must be overcome by the aircraft commander.

"In summation, it must be realized that aircraft operation still requires command by an individual . . . and it must be that individual's responsibility for the safety of his passengers and crew."

C.R.'s triumphant departure from a successful rescue deployment is icing on the cake until old Man Winter substitutes a different kind of icing.



Can't think of a better way for us Rescue types to start out the new year," C.R. pontificated to his long suffering copilot. The Great One pushed forward on the rotor brake, halting the H-3's whirling blades "I guess we've done about as much good as we can do up here, and besides, the National Guard chopper units are up to speed now. They can take up the slack when we leave."

"That's right, Boss," Sam offered, "The frostbit farmer we just medevaced to the hospital makes the 49th person we've helped."

"And if you count the cow we rescued yesterday it makes an even 50," C.R. reasoned. "I think we oughta count the cow. Poor critter woulda surely froze if we hadn't airlifted it back to safety."

"Too bad we delivered that heifer to the wrong spread, though," Sgt. Hammer, the fling-wing flight mech piped in. "That farmer had no sense of humor at all. Glad we were able to talk him out of filing cattle rustling charges."

"Oh well," rationalized the Heavy Hover-Lover, even 49's not bad for a week's work, especially when you consider all those emergency supplies we hauled out to snowed-in folks who had no heat or electricity."

"Speaking of a sense of humor," C.R. herded the conversation back to a previous train of thought, "sorry about your boots, Sgt Hammer. I had no idea that bedraggled bovine wasn't housebroken."

"That's okay, Major, I was raised on a farm and it was kinda like being back home in Indiana. Sorta made me homesick, sir," Hammer added wistfully.

"Roger the sick," interjected Sgt Spiffy, the pararescue punster.

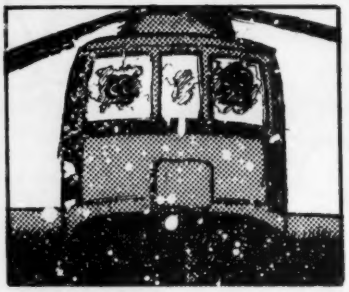
After securing the Jolly Green Giant for the night, the Chief Rotorhead and crew walked across the frozen ramp toward the hanger which doubled as the state's disaster control center for the blizzard relief effort. Sam's teeth began chattering as the snow swirled around his boots. "Don't it just warm the cockles of your heart, Sammy m'lad, to know we've helped so many people?" C.R. beamed.

"Yes sir, Boss," Sam shivered, "But that's probably the only part of me that *is* warm. My bones have been frozen stiff ever since we crossed the Mason-Dixon line last week."

"It's all in your mind, Sammy," the Hot-Blooded Helo Honcho harangued. "You've merely got to learn to think warm. See those 15-foot-high snow drifts over there? Just pretend they're pure white sand dunes gleaming in the Florida sun down along the Gulf Coast."

"I try to think warm, Boss, but until it gets above freezing, my body overrules my imagination. When the daily high temperature barely makes the double digits and the wind-chill factor's down around absolute zero, I'm miserable."

"Gotta be tough to fly the heavy lifters, heh, heh," the Pompous Pilot pronounced as he swung the door open with a flourish, adding, "Coffee's on me, folks."



Before they all got through the door, Colonel Rick O'Shay, the National Guard blizzard relief coordinator was upon them. "Oh, there you are, Major Terror," the Guardsman began in his rapid, machine-gun-like style of speech. "I've got both good and bad news. First, your headquarters just confirmed your departure tomorrow, weather permitting, which brings us to the bad news. A warm front is supposed to pass through here in the morning and dump sleet and freezing rain on us before it changes to snow later on in the day. Because of the ice threat our aviators are going to put their UH-1's in the hangar and wait it out—at least until the stuff turns to snow. You can use the south end of the hangar for your aircraft. There's plenty of room," offered the hospitable honcho.

"Thanks just the same, colonel, but I'm not going to let a little inclement weather keep me from departing as scheduled tomorrow," the Clutcher of Collectives calculated. "You see, sir, our craft isn't as sensitive to the wiles of winter as some helicopters. I've rotorvated through tempests so bad even the birds were walking. And icing's no problem because we have five rotor blades to compensate for any buildup. Your Hueys only have two blades so they naturally can't hack it. If the ice didn't shed evenly in flight the imbalance would just shake 'em to pieces," concluded the Professor of Pilotdom.

"Sounds very interesting, Major Terror, but I'm not a pilot, so the finer points of helicopter aerodynamics escape me," explained the colonel. "All I know is our Guard aviators are standing down. But if you feel it's safe to fly your aircraft tomorrow, it's certainly your decision as pilot-in-command. This evening, however, allow me to stand you and your crew to a round of cheer in appreciation for your outstanding contribution to Operation Blue Nose."

"Now you're talking, Colonel," the Bibulous Buffoon bellowed. "Maybe a couple Terrorific 'Tinis will thaw out my copilot here."

Next morning the Raja of Rescue gathered his crew at the airport snack bar for breakfast and a typical C.R. Terror preflight briefing.

"Okay, Sam, after we down our coolade and grits, you and Sgt Hammer can start the walkaround. I'll file a certified FAA flight plan over at Flight Service, then stop by the weather shop and get my favorite civilian weather person, Ms Nancy Nimbus, to give me an up-to-the-minute meteorological massage."

By the time C.R. returned to the aircraft, small bits of sleet were already being blown about by the southerly breezes. Colon-

el O'Shay was on hand to bid farewell to the Terrorific rescue team. "It's not too late to put your chopper in the hanger, Major," the considerate colonel offered tactfully, as they watched the sleet and freezing rain begin glazing the nose of the Jolly Green.

"No thanks, sir. The weather experts say we ought to punch through this freezing precip about 40 miles down the pike."

"Well, good luck to you. And thanks again." O'Shay waved as he retreated to the dry haven of the hangar.

"Boss, you sure we can get through this stuff?" Sam asked as he strapped in.

"Not to worry, my cold-natured neophyte," C.R. soothed. "We'll be in the clear before we get over those hills to the south. Ms. Nimbus assured me this freezing rain should turn to snow within the hour."

"Is everybody ready?" queried the Over-confident Collective Clutcher.

"Roger," came the almost unanamous response. Sam's face was skewed toward his AC with worry written all over his forehead. He adjusted the windshield wipers in an unsuccessful attempt to free some of the sticking sleet from the perspex.

"Up, up and away," shouted the Rotund Rotorhead, pulling the collective into his armpit and jolting the heavy helicopter into a max performance takeoff directly over the big hangar.

Heading south, they approached high ground and Sam began squirming in his seat and peering intently out both the front and side windows. "We're picking up a lot of ice, Boss," he observed, "and it's taking nearly max-continuous power to hold altitude."

"No sweat," the All-Weather Wizard boasted. "This bird sheds ice like a duck sheds water. Watch!" With that C.R. pumped the collective rapidly up and down and jerked the cyclic back and forth while simultaneously increasing rotor rpm. "It's an old trick for ridding one's rotors of unwanted accretions," he explained with the smug confidence of a poker player holding four aces.

Suddenly the back end of the aircraft shuddered violently as a huge sheet of ice slammed into the tail rotor, sending the chopper into a wildly gyrating yaw to the right.

"What's going on here," C.R. shouted over the intercom. "I've lost some directional control."

"Feels like the tail rotor, sir," came the reply from the flight mechanic. "I think we may be losing it."

"Okay crew," C.R. screeched, "I'll have to set her down on that knoll straight ahead. Gear down, Sam."

The deep snow covering the top of the hill cushioned the landing and prevented the yawing helicopter from turning over as it slid into a five-foot drift.

"Everybody all right?" the Addled Autorotator asked.

"We're okay," the others replied nearly in unison.

"Are we still in contact with Blue Nose control, Sam?" the Somber Skipper solicited after stopping the rotors.

"Yes sir," his faithful sidekick confirmed. "They're loud and clear on UHF and the tacan's still locked on the airport at 21 miles due north."

C.R. winced as he keyed the mike. "Blue Nose, Blue Nose, this is Air Force Rescue 007."

"Roger, 007, this is Blue Nose, go ahead." The voice was that of Colonel O'Shay.

"Uh, roger Blue Nose, we had to make an emergency landing 21 miles south because of ah . . . er, a tail rotor problem. No injuries, but we require assistance, over," the Mortified Major mumbled.

"Roger, 007," came the reply. "Just sit tight, we'll launch one of our choppers as soon as it's safe to do so. We can't fly in this kind of icing like some people can," the Army Guardsman replied with a hint of sarcasm in his voice.

"He knows," C.R. mumbled to himself, "I can tell it, he knows!"

Soon after the sleet finally turned to dry snow, the whop-whop of the huey's rotors stirred the silence as it settled beside the crippled H-3. Colonel O'Shay was the first out of the olive-drab helicopter and came trudging through the deepening powder toward C.R. and his forlorn followers.

"Greetings, Major Terror, happy to see everyone safe and sound. Can we give you a lift?" O'Shay quipped with a twinkle in his eye. "Looks like your stay in the cold north has just been extended a few days," he said, glancing at the mangled tail rotor.

The rescuers became the rescuees as they clambered aboard the National Guard chopper. As they were strapping in for the short hop back to the airport, the Abominable Aeronaut turned to his long sufferin' copilot. "You know, Sam, I do believe it *is* getting a tad nippy out," he observed with a slight shiver. "Did I ever tell you about the time I was stranded on the Greenland ice cap for two weeks?"

Sam shook his head from side to side and asked the Huey pilot to turn up the heat.

QUICK STOPPERS

What You See Ain't What You Got

A VC-10 diverted to Manchester and commenced an ILS approach. The sharp crew spotted the fact that the Number One glide slope bar had frozen in the "on glide" position, without the failure flag appearing. You can picture another result, can't you? Thumb in bum, on the glide, bad weather, CRUNCH! Cause of accident. . .not known.

Look, use cross references, and stay alive.

—Adapted from RAF *Ostrich*

Let Me Put It This Way . . .

There is more than one way to skin a cat, or say "No" to an ATC controller when the need arises, as the following "war story" illustrates.

Legally, a pilot can refuse any clearance that appears to be hazardous, but the manner in which he or she refuses it, or says "No," can either start a confrontation or end in a very pleasant feeling for both parties concerned. In most cases a "No" or refusal can be said just as nicely as any other way. People from the "Deep South" really know how to do such things with finesse. Down in Georgia one night, a controller cleared an aircraft to "descend and maintain 2,000 feet." After a moment of silence, a deep, sleepy-sounding voice drawled back, "Why, we thank y'all kindly, sir, but seein' as how there's a big ole tower down there stickin' up about 2,500 feet, we reckon we'd better stay up here fo' the time bein'. Shorely do appreciate it though."

Now that's class. It is also a prime example of showing respect and saying "No" to a clearance in a nice sort of way.

—Adpated from *Flight Safety Focus*

Tough Transition

The crew's first night weather precision radar approach put them in a less-than-acceptable position for landing, so the AC decided to go missed approach. The second PAR run for the four-engine transport was much better, and the runway environment was sighted at decision height. Subsequent touchdown was on centerline, but 150 feet short of the threshold. The airplane landed on a paved overrun, but damage from debris required over 140 man-hours to repair.

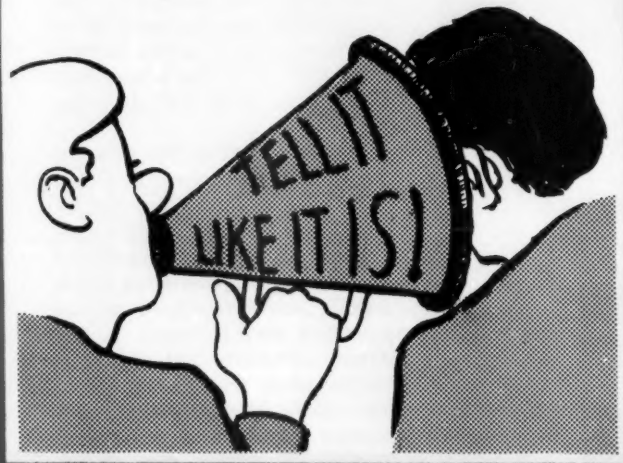
The basic cause of this mishap is readily apparent, a duck-under or dive for the runway after decision height. Many aviators might guess that the pilots were inexperienced, but actually all three crewmembers looking out the windscreen that night (two pilots and an engineer) were highly experienced. They all believed that they were above the normal glide slope despite the radar controller's warnings that they were below glide slope.

The morals from this little incident are fairly obvious. First, nobody is exempt from human error. The AC was a highly respected flight examiner and had many years of experience in the aircraft type. Procedures and regulations were followed "to the letter." However, at decision height, when the crew had trouble making the transition from cockpit instruments to outside landing references, they chose to ignore the radar controller's warnings. This type of landing transition is admittedly difficult, and for it to be done well crews must use all available references, including the controller's instructions.

Notable Quote

Aviation's worst enemy is ignorance of the price we pay for ignorance. The joys of flying do not belong to the timid, the naive, and the ignorant; they belong to those who are mature enough to realize that what is bad in aviation should be exploited to make what is good about it better. Therefore, the most honest way to promote aviation—and safety—is to tell it like it is to those who are willing to listen.

—Gerard Bruggink
NTSB



Uncontrolled Herks

During a training mission, the Herk's copilot flew an approach with the left outboard turboprop simulated out. During the practice three-engine missed approach, the right-seater couldn't apply enough rudder to eliminate the C-130's tendency to turn into the "dead" engine. In fact, both pilots discovered, to their chagrin, that neither could move the rudder pedals at all. They terminated the simulated emergency and the flight engineer went to the cargo compartment to check the rudder actuators. Surprisingly, he didn't find some sort of massive hydraulic leak, but discovered that the rudder actuator was completely disconnected from the rudder bell crank. The pilot used aileron control to gingerly maneuver the Hercules for a long, VFR straight-in approach to an uneventful landing.

In another part of the world, a C-130 pilot noticed that full-right yoke was needed to keep the wings level shortly after takeoff. Also, right turns were practically impossible. From the cargo compartment, the loadmaster announced that both ailerons were deflected upward. Again the crew recovered the airplane by using gentle turns to a straight-in approach. After landing, investigators found the left-aileron push-pull rod disconnected with a parts bag attached to one end.

In both cases, the flight controls had checked normal during the engineer's preflight. However, further investigation showed that both problems should have been detected by maintenance or aircrew inspections, but obviously weren't. Fortunately, neither crew needed all the Herk's control authority to safely recover the aircraft.

AFTER DEADLINES

IN THE WAKE OF HURRICANES DAVID AND FREDERIC, MAC aircrews recently completed their part in a massive three-month disaster relief mission in the Caribbean. MAC involvement began on 27 August when WC-130s began surveillance of Hurricane David. The storm virtually destroyed the island of Dominica, and heavily damaged others in its path. Frederic followed close on David's heels and severely hampered C-141 and C-130 relief flights. Starlifters airlifted 2,228 tons of emergency material into the region, and 124 C-130 missions flew the vitally needed supplies out to remote areas. The final relief mission carried supplies from Puerto Rico to the Dominican Republic on 21 Nov 1979, concluding a superb cooperative effort between MAC and the other U. S. forces involved.

COMMANDANT OF THE U. S. MARINE CORPS, GENERAL R. H. BARROW, expressed thanks to MAC for help in evacuating Marines injured in the tragic fire at Camp Fuji, Japan. Three were killed outright and 43 severely burned when leaking fuel from a storm-damaged tank ignited and burst through the barracks compound. Casualties were taken first to Yokota AB where doctors determined that many needed specialized treatment at the U. S. Army Burn Center, San Antonio, Texas. Members of the 9th AES, Clark AB, Philippines, went to Yokota to prepare the victims for the flight to San Antonio where two C-141s were specially rigged with medical equipment. People from Det 5, 375 AAW, met the incoming patients and provided care enroute. General Barrows complimented MAC for being "a 'can do' organization that has no equal."

THE 1,000TH SAVE BY RESCUE IN 1979 WAS ACCOMPLISHED on 24 November by an HC-130 crew from the 71st ARRS, Elmendorf, Alaska. An NCO stationed at remote Galena AFS had a possible broken neck and was rushed to Elmendorf by the crew for emergency medical treatment. The quick response saved his life and for the 1,000th time in '79 the people of ARRS demonstrated their profound dedication to the motto, "That Others May Live."

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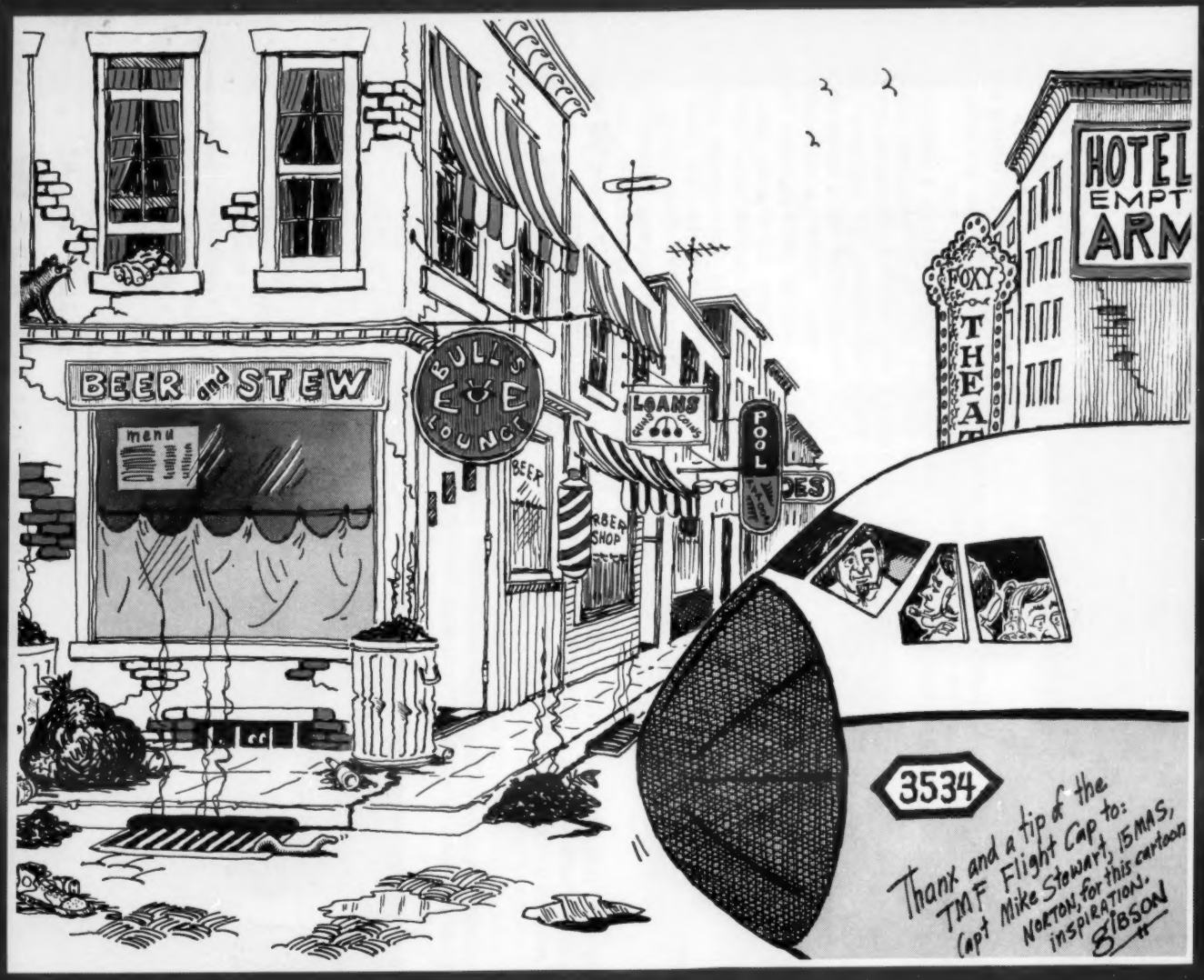

"Okay, let's have another look at that airfield diagram, Cranston!"